

Appn. No. 10/647,677
Amdt. dated: March 25, 2005
Reply to Office Action dated December 28, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method for varying an operating band of an antenna, comprising the steps of:

magnetically and electrically coupling at least one antenna element to a fluid dielectric comprising magnetic particles; and

varying a volume of said fluid dielectric coupled to said at least one antenna element to selectively maximize efficiency of said antenna element on a plurality of operating bands.

2. (Currently amended) The A method for according to claim 1 wherein said varying step further comprises an operating band of an antenna, comprising the steps of:

magnetically and electrically coupling at least one antenna element to a fluid dielectric; and

varying a volume of said fluid dielectric coupled to said at least one antenna element to selectively maximize efficiency of said antenna element on a plurality of operating bands and controlling said volume to selectively provide an efficient impedance match with an antenna feed circuit of said a least one antenna element for each of said operating bands.

3. (Original) The method according to claim 1 wherein said varying step further comprises varying said volume to selectively cause said at least one antenna element to be resonant at said plurality of operating bands.

4. (Canceled)

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5. (Original) The method according to claim 1 wherein said varying step further comprises varying at least one of a capacitive and a magnetic loading of said at least one antenna element.

6. (Original) The method according to claim 1 wherein said coupling step further comprises coupling said fluid dielectric to said at least one antenna element over a continuous area defined by said at least one antenna element.

7. (Currently amended) ~~The A method according to claim 1 wherein said coupling step further comprises for varying an operating band of an antenna, comprising the steps of:~~

~~selectively distributing said a fluid dielectric to a plurality of separate cavity structures coupled to said at least one antenna element to magnetically and electrically couple said at least one antenna element to said fluid dielectric; and~~

~~varying a volume of said fluid dielectric coupled to said at least one antenna element to selectively maximize efficiency of said antenna element on a plurality of operating bands.~~

8. (Original) The method according to claim 7 further comprising the step of distributing said cavity structures about an area defined by said at least one antenna element.

9. (Original) The method according to claim 7 further comprising the step of distributing said cavity structures spaced from one another along a direction extending from said at least one antenna element to a ground plane of said antenna element.

10. (Currently amended) An antenna, comprising:

at least one antenna element;

a fluid dielectric magnetically and electrically coupled to said antenna element;

and

a fluid control system comprising:

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a controller responsive to a control signal for indicating operation on a specified antenna band and to a feedback loop communicating information associated with a performance characteristic of said antenna;

wherein said fluid control system selectively varying varies a volume of said fluid dielectric coupled to said antenna element, whereby to permit efficient operation of said antenna element is provided on a plurality of operating bands.

11. (Original) The antenna according to claim 10 further wherein said antenna element is disposed on a dielectric substrate.
12. (Original) The antenna according to claim 11 wherein at least one cavity structure is defined in said dielectric substrate for constraining said fluid dielectric.
13. (Original) The antenna according to claim 12 wherein said at least one cavity structure is substantially continuous within an area defined by said at least one antenna element.
14. (Original) The antenna according to claim 12 comprising a plurality of said cavity structures.
15. (Original) The antenna according to claim 14 wherein said plurality of cavity structures are distributed about an area defined by said at least one antenna element.
16. (Currently amended) The An antenna according to claim 14 comprising:
at least one antenna element disposed on a dielectric substrate;
a fluid dielectric magnetically and electrically coupled to said antenna element;
a fluid control system responsive to a control signal for selectively varying a
volume of said fluid dielectric coupled to said antenna element, whereby operation of
said antenna element is provided on a plurality of operating bands; and
wherein a plurality of cavity structures are defined in said dielectric substrate for
constraining said fluid dielectric, said plurality of cavity structures are being spaced from

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one another along a direction extending from said at least one antenna element to a ground plane of said antenna element.

17. (Currently amended) The An antenna according to claim 10 comprising:
at least one antenna element;
a fluid dielectric magnetically and electrically coupled to said antenna element;
a fluid control system responsive to a control signal for selectively varying a
volume of said fluid dielectric coupled to said antenna element, whereby operation of
said antenna element is provided on a plurality of operating bands;

wherein said fluid control system comprises a controller and said controller selectively varies said volume to provide an impedance match with an antenna feed circuit of said at least one antenna element for each of said operating bands.

18. (Original) The antenna according to claim 10 wherein said fluid control system comprises a controller and said controller selectively varies said volume to cause said at least one antenna element to be resonant at said plurality of operating bands.

19. (Original) The antenna according to claim 10 wherein said fluid dielectric is comprised of magnetic particles.

20. (Original) The antenna according to claim 10 wherein said fluid control system comprises a controller and said controller selectively varies at least one of a capacitive and a magnetic loading of said at least one antenna element.